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Notes on some little known *Lethe* Hübner, 1819 from Nujiang and Dulongjiang, NW Yunnan, China, with descriptions of a new subspecies

(Lepidoptera, Nymphalidae, Satyrinae)

by

Song-Yun Lang

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Abstract: In this paper, some little known satyrid species of the genus *Lethe* Hübner, 1819 from Nujiang and Dulongjiang, Gongshan County, NW Yunnan are studied. A new subspecies is described, viz. *L. albolineata* ***ruoyuae*** Lang **subspec. nov.** from Nujiang. *Zophoessa nosei* Koiwaya, 2000 is transferred to the genus *Lethe* Hübner, 1819, viz. *L. nosei* (Koiwaya) **comb. nov.**, and it is recorded from the fauna of China for the first time. *L. kazuichiroi* Yoshino, 2008 is also recorded from China for the first time. The following taxa are noted, *L. wui* Huang, 1999, *L. gracilis zhuhui* Bozano, 2014 and *L. umedai albofasciata* Huang, 2002.

Materials studied in this paper were mainly collected by the author from his trip to Nujiang (Salween) Valley and Dulongjiang (upper water of Nmai Hka River) Valley, Gongshan County, NW Yunnan province, SW. China from June 11st to July 27th in 2015. Photographs of the holotype of *Lethe kazuichiroi* Yoshino, 2008 kept in MNHAH were provided by Mr. N. Nakamura (Japan).

Abbreviations:

CMNH	Chongqing Museum of Natural History, Chongqing, CHINA
MNHAH	Museum of Nature and Human Activities, Hyogo, JAPAN
HH	Hao Huang's private collection, Qingdao, Shandong, CHINA
LSY	S-Y. Lang's private collection, Shuangliu, Chengdu, Sichuan, CHINA
DFW	Dorsal forewing
DHW	Dorsal hindwing
VFW	Ventral forewing
VHW	Ventral hindwing
TL	Type locality

Lethe nosei (Koiwaya, 2000) **comb. nov.** (figs. 1-3)

Zophoessa nosei Koiwaya, 2000, Notes on Eurasian Insects **3**: 51, figs. 63-66. TL: Mapanput, North Kachin, Myanmar.

Lethe nosei (Koiwaya) **comb. nov.** is a recent known species and only has been obtained from the northern Kachin state of Myanmar until its publication. In this paper, it is recorded from the fauna of China for the first time. Its ♂ genitalia is illustrated (figs: 24, 28a), which has not been reported before.

Generic classification: More than a dozen generic names, including *Zophoessa* Doubleday, [1849], have been established to arrange more than 100 species contained in the genus *Lethe* Hübner, and until now there are still many modern authors who treated *Zophoessa* Doubleday as a distinct genus, for example De Lesse (1956), Koiwaya (2000), Koiwaya & Shizuya (2011) and Huang et al. (2003). According to Huang (2014), „There is no evidence to prove that the genus *Zophoessa* is basal on the phylogenetic tree of the species of both genera *Zophoessa* and *Lethe*, thus it is more reasonable to use the genus *Lethe* to include all species of *Zophoessa*, though the genus *Zophoessa* is most likely monophyletic", the present author believes that it is sound to consider *Zophoessa* Doubleday as a subgenus of *Lethe* Hübner. Thus, *Zophoessa nosei* Koiwaya is transferred to the genus *Lethe* Hübner.

Material: 2 ♂♂, China: Yunnan, Gongshan, East slope of Mts. Gao-li-gong, 3200 m, 25.VII.2015, leg. S-Y. Lang, LSY.

Distribution: China (NW Yunnan), Myanmar (N. Kachin).

Lethe wui Huang, 1999 (figs: 5, 6)

Lambillionea **99** (1): 129, figs. 2a, 3a. TL: Metok, S.E. Tibet.
Zophoessa wui Huang, 2003, Neue Ent. Nachr. **55**: 150, pl. 8: 5; Koiwaya & Shizuya, 2011, Gekkan-Mushi **480**: 31.

Lethe wui Huang, 1999 was described based upon one ♂ from Medog, SE. Tibet, and recently Koiwaya & Shizuya (2011) reported that *L. wui* Huang was also collected at Panwa, Kachin State, N. Myanmar. In this paper, it is the first record of this species from Nujiang valley, Yunnan. It is worth to note another little known species from the nearby region, viz. *Lethe lyncus* De Nicéville, 1897 from Bhutan, Sikkim and Manipur (Bingham, 1905; Tytler, 1914 ; Fruhstorfer, 1911; Talbot, [1949]). Judging from its original descriptions as well as the chromatic draw (fig: 4) based upon

2 ♂♂ from Sikkim, *L. lyncus* De Nicéville is superficially very similar to *L. wui* Huang. Doubtfully, no DFW ♂ brand is definitely mentioned in the original descriptions of De Nicéville, whereas in *L. wui* Huang, the ♂ brand is present. Talbot ([1949]) treated *lyncus* De Nicéville as a subspecies of *Lethe ocellata* (Poujade, 1885) and noted that "the male with a brand as in *tristigmata* Elw." According to the text of Talbot, it seems that *L. lyncus* De Nicéville is also a species with ♂ brand. In this study, the ♂ brand of one specimen of *L. wui* Huang is obviously smaller than that of another specimen, therefore the degree of the development of the ♂ brand is variable individually. Accordingly, *L. wui* Huang is possibly only a synonym or a subspecies of *L. lyncus* De Nicéville, but for confirmation, the type or material from Sikkim of the latter taxon need to be examined. The ♂ genitalia of *L. wui* Huang is illustrated in this paper (figs: 25, 28b).

Material: 2 ♂♂, China: Yunnan, Gongshan, East slope of Mts. Gao-li-gong, 2800 m, 24.VII.2015, leg. S-Y. Lang, LSY.

Distribution: China (NW Yunnan, SE. Tibet), Myanmar (Kachin).

Lethe gracilis zhuhui Bozano, 2014 (figs: 7, 8)

Revue des Lépidoptéristes de France **23** (58): 1; TL: China, N Yunnan, Meili Xue Shan, trail between Xidong and Yubeng, eastern slopes.

Lethe gracilis zhuhui Bozano, 2014 was described from Lancangjiang (upper Mekong) valley in NW Yunnan recently. Materials also have been collected by the present author and Mr. Hao Huang from Nujiang valley and Jinshajiang (upper Yangtse) valley in NW Yunnan.

Material: 1 ♂, China: Yunnan, Yulong, Ludian, 3.VII.2014, leg. Hao Huang, LSY; 1 ♂ China: Yunnan, Shangri-la, Tuguancun, 4.VII.2014, leg. Hao Huang, LSY; 1 ♂ China: Yunnan, Gongshan, East slope of Mts. Gao-li-gong, 2800 m, 20.VI.2015, leg. S-Y. Lang, LSY; 1 ♂, ditto, 20.VII.2015, leg. S-Y. Lang, LSY.

Distribution: China (N. Yunnan).

Lethe albolineata r u o y u a e **subspec. nov.** (figs: 9, 10)

Holotype ♂, China: Yunnan, Gongshan, East slope of Mts. Gao-li-gong, 2800 m, 26.VII.2015, leg. S-Y. Lang, LSY.

Lethe albolineata (Poujade, 1884) (figs: 11, 12), with only the nominate subspecies, has been known from the central China region, including Sichuan (TL: Moupin), Chongqing and W. Hubei. It is recorded from Nujiang valley, NW Yunnan for the first time and is described as a new subspecies here. At first glance in nature, the new subspecies is very similar to *Lethe ramadeva* (De Nicéville, 1887) (figs: 13, 14) which flies together with the former.

Diagnosis: The new subspecies can be distinguished from the nominotypical subspecies by the combination of the following characters:

1. On both sides, ground colours are paler and more vivid than those of *L. a. albolineata* Poujade.
2. On ventral side of both wings, white discal and postdiscal bands are broader than those of *L. a. albolineata* Poujade.
3. On ventral side of both wings, creamy marginal and submarginal lines are wider than those of *L. a. albolineata* Poujade.
4. On VFW, white discal and postdiscal bands are connected in space 2, whereas they are separated from each other in *L. a. albolineata* Poujade.
5. The crest on the dorsal ridge of the uncus (fig: 27) is more protruding than that of *L. a. albolineata* Poujade (fig: 26).
6. The tegumen is more humped caudally than that of *L. a. albolineata* Poujade.
7. In dorsal view, the inner edge of the apical half of the valva (fig: 28d) is more serrate than that of *L. a. albolineata* Poujade (fig: 28c).

Etymology: The subspecific name *ruoyuae* is named after Mrs. Ruo-Yu Jiang from Chengdu, my grandmother.

Distribution (fig. 29): China (NW Yunnan).

Additional material: For comparing with the new subspecies, the following specimens of *L. a. albolineata* (Poujade) have been studied: 1 ♂, China: Sichuan, Ebian, Heizhugou, 1800-2000 m, 18.VIII.2013, leg. S-Y. Lang, LSY; 29 ♂♂, ditto, 14.-18.VII.2014, legs. Yi Lang & S-Y. Lang, LSY; 1 ♂, China: Sichuan, Pengzhou, Mt. Jiufengshan, 1200-1300 m, 12.VII.2015, leg. Yi Lang, LSY; 1 ♂, China: [Chongqing], ginfu [Nanchuan, Mt. Jifoshan], 1400 m, JUL 11 1932, leg. Wang, CMNH.

Lethe umedai albofasciata Huang, 2002 (figs: 15, 16)

Atalanta **33** (3/4): 366. TL: Dulongjiang valley, Yunnan.

An interesting gynandromorph is illustrated in this paper: Material: 3 ♂♂, 1 ♀, China: Yunnan, Gongshan, Dulongjiang, Mudang to Xiongdang, 2000-2200 m, 7.VII.2015, leg. S-Y. Lang, LSY; 9 ♂♂, 15 ♀♀, China: Yunnan, Gongshan, Dulong-jiang, Xiongdang, 2000 m, 9.-11.VII.2015, leg. S-Y. Lang, LSY; 1 ♂, ditto, 3.VII.2015, leg. S-Y. Lang, LSY; 1 gynander, ditto, 10.VII.2015, leg. S-Y. Lang, LSY.

Distribution: China (NW Yunnan).

Lethe kazuichiroi Yoshino, 2008 (figs: 17-19, 22, 23)

Futao **54**: 9, pl. 2: 1, 2. TL: Kachin state, North Myanmar.

Lethe kazuichiroi Yoshino, 2008 was described based upon 1 ♂ from Kachin which is kept in MNHAH, and with the help of Mr. Nakamura, high quality photographs of the holotype have been studied. According to Mr. Nakamura (pers. comm.), the ♂ genitalia of the holotype is not kept in MNHAH together with the adult specimen. The ♂ genitalia picture (fig: 20) in the original description of Yoshino (2008) is a simple line drawing, and judging from the figure, two characters are noticeable. The first, the uncus of *Lethe kazuichiroi* Yoshino is tapering and not strongly bent downwards, whereas the apex of the uncus is strongly bent downwards in its closely related species *L. hyrania* (Kollar, 1844) (Lang & Lamas, 2016). The second, the saccus is very short, however its author did not mention the saccus in his text. The 2 ♂♂ which are similar to this species were obtained from upper Dulong valley, NW Yunnan. No obvious superficial difference can be found between the new found specimens and the holotype. The uncus (fig: 21) studied here is also the same as the line drawing figure of Yoshino (2008), and it is sharply tapering but only weakly hooked at the tip. Nevertheless, the saccus examined here is in normal length but not as short as that of the line drawing figure of Yoshino (2008). Considering the similarity, not only the superficial appearances but also the other characters of the ♂ genitalia, the short saccus drew by Yoshino (2008) should only be a mistake, and the present author believes that specimens examined here is indeed *Lethe kazuichiroi* Yoshino, which is recorded from the fauna of China for the first time. By the way, the label of the holotype (fig: 19) is written as "*Lethe nmyanmera* sp. n.", but is not the published name „*kazuichiroi*".

Diagnosis: *Lethe kazuichiroi* Yoshino is similar to the following related species from N. Myanmar and its surrounding areas, including *L. brisanda* De Nicéville, 1886, *L. sadona* Evans, 1932 and *L. hyrania* (Kollar), and can easily be distinguished from them by the combination of the following external characters:

1. On DHW, a tuft of upturned hairs along the upper part of the cell is present in *L. sadona* Evans, whereas it is absent in the other related species including *L. kazuichiroi* Yoshino;
2. On VFW, discal line is straight and directs to the inner margin in *L. brisanda* De Nicéville, whereas it is sinuous and directs to the tornus in the other related species including *L. kazuichiroi* Yoshino;
3. On VHW, brownish discal line is very close to the separating point of veins 3 and 4 in *L. kazuichiroi* Yoshino, whereas it is always far beyond the point when it crosses the space 3 in the other species.

Material: Photo, 1 ♂, Myanmar: Holotype Yoshino coll./ *Lethe nmyanmera* sp. n./ JUL 20, 2000, Kachin N. Myanmer, MNHAH; 1 ♂, China: Yunnan, Gongshan, Dulong-jiang, Nandai, 2200 m, 9.VII.2015, leg. Xiao-Dong Yang, LSY; 1 ♂, ditto, HH.

Distribution: China (NW Yunnan), Myanmar (Kachin).

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Address of the author

SONG-YUN LANG
Chongqing Museum of Natural History
Beibei, 400700, Chongqing, China
langsongyun@gmail.com

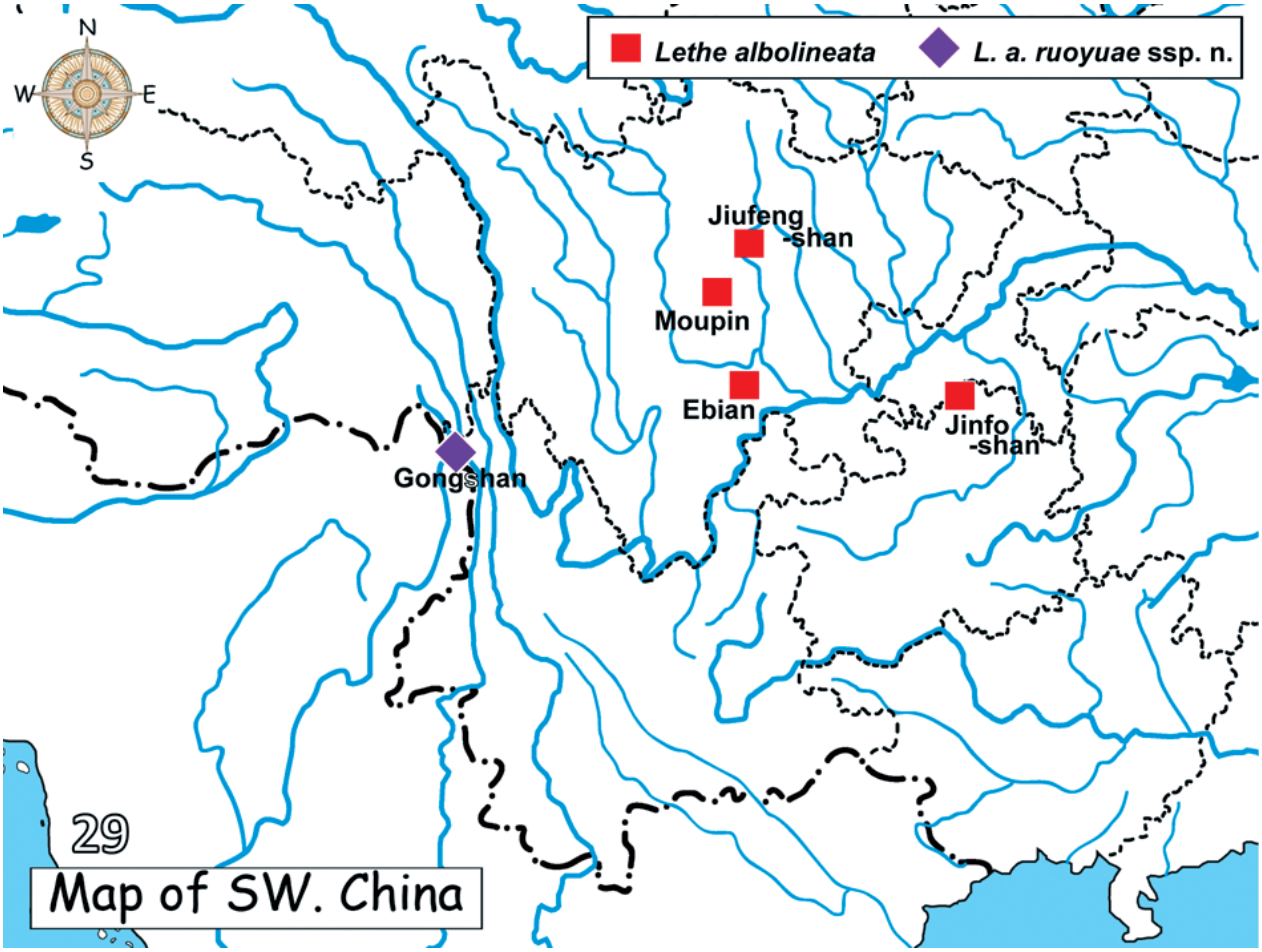

Fig. 29: Distribution map of *Lethe albolineata* (Poujade, 1884).

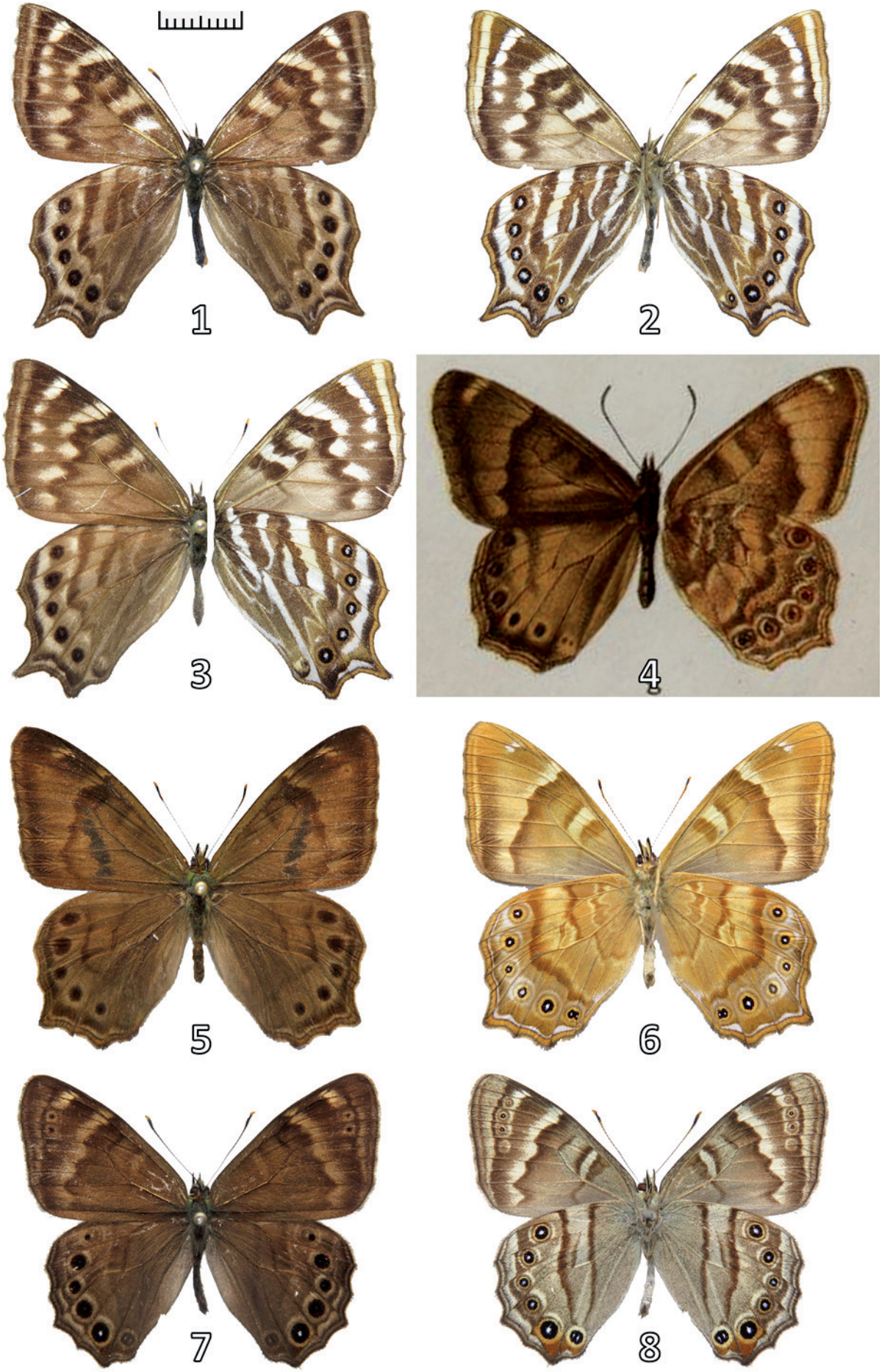

Fig. 1-3: *Lethe nosei* (Koiwaya, 2000) comb. nov., ♂♂, China, Yunnan, Gongshan, LSY, dorsal- and ventral side.
Fig. 4: *Lethe lyncus* De Nicéville, 1897, „Pl I: 8“ in De Nicéville (1897).
Fig. 5, 6: *Lethe wui* Huang, 1999, ♂, China, Yunnan, Gongshan, LSY, dorsal- and ventral side.
Fig. 7, 8: *Lethe gracilis zhuhui* Bozano, 2014, ♂, China, Yunnan, Gongshan, LSY, dorsal- and ventral side.

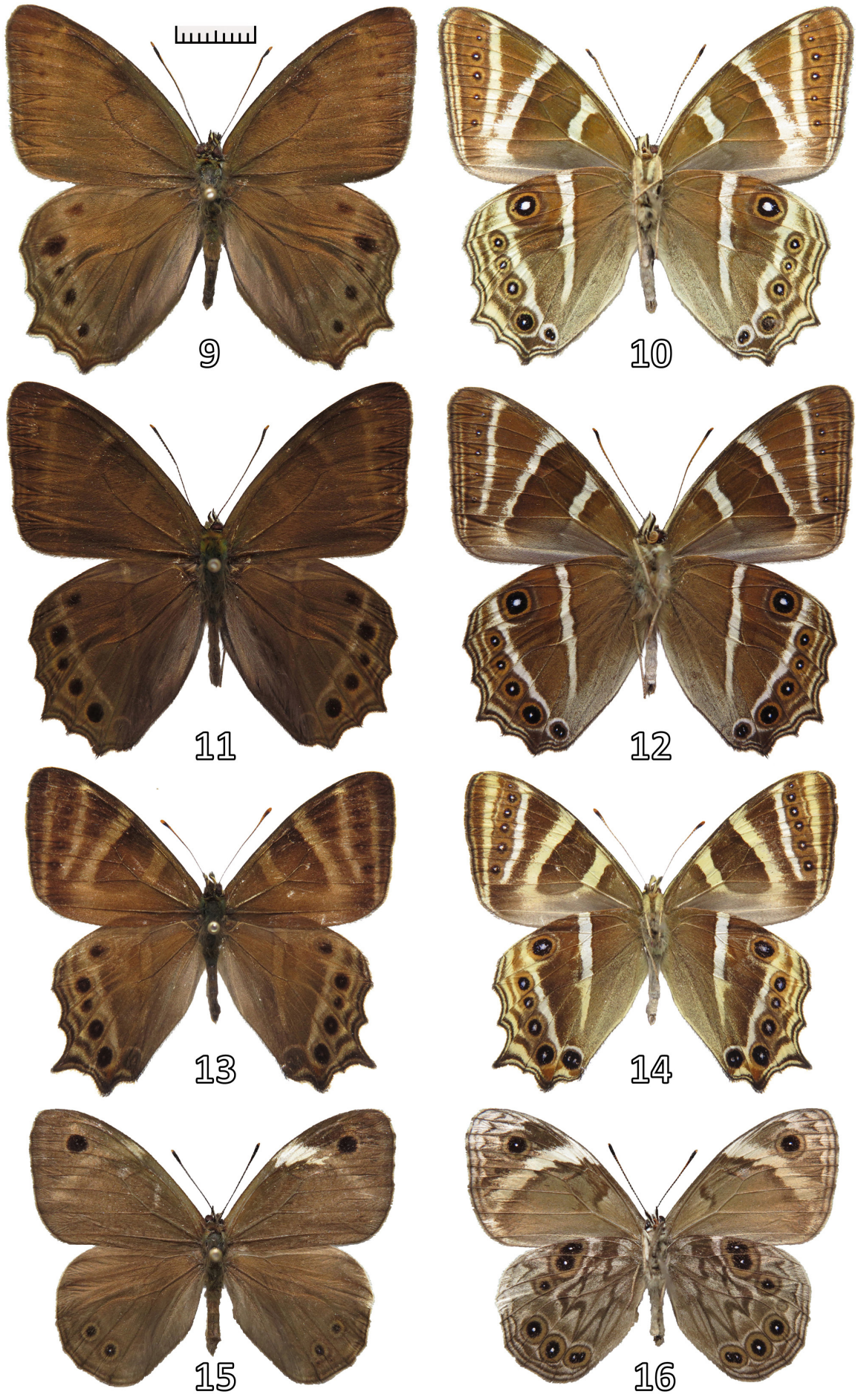

Fig. 9, 10: *Lethe albolineata ruoyuae* **subspec. nov.**, holotype ♂, China, Yunnan, Gongshan, LSY, dorsal- and ventral side.
Fig. 11, 12: *Lethe albolineata albolineata* (Poujade, 1884), ♂, China, Sichuan, Ebian, LSY, dorsal- and ventral side.
Fig. 13, 14: *Lethe ramadeva* (De Nicéville, 1887), ♂, China, Yunnan, Gongshan, LSY, dorsal- and ventral side.
Fig. 15, 16: *Lethe umedai albofasciata* Huang, 2002, gynander, China, Yunnan, Gongshan, LSY, dorsal- and ventral side.

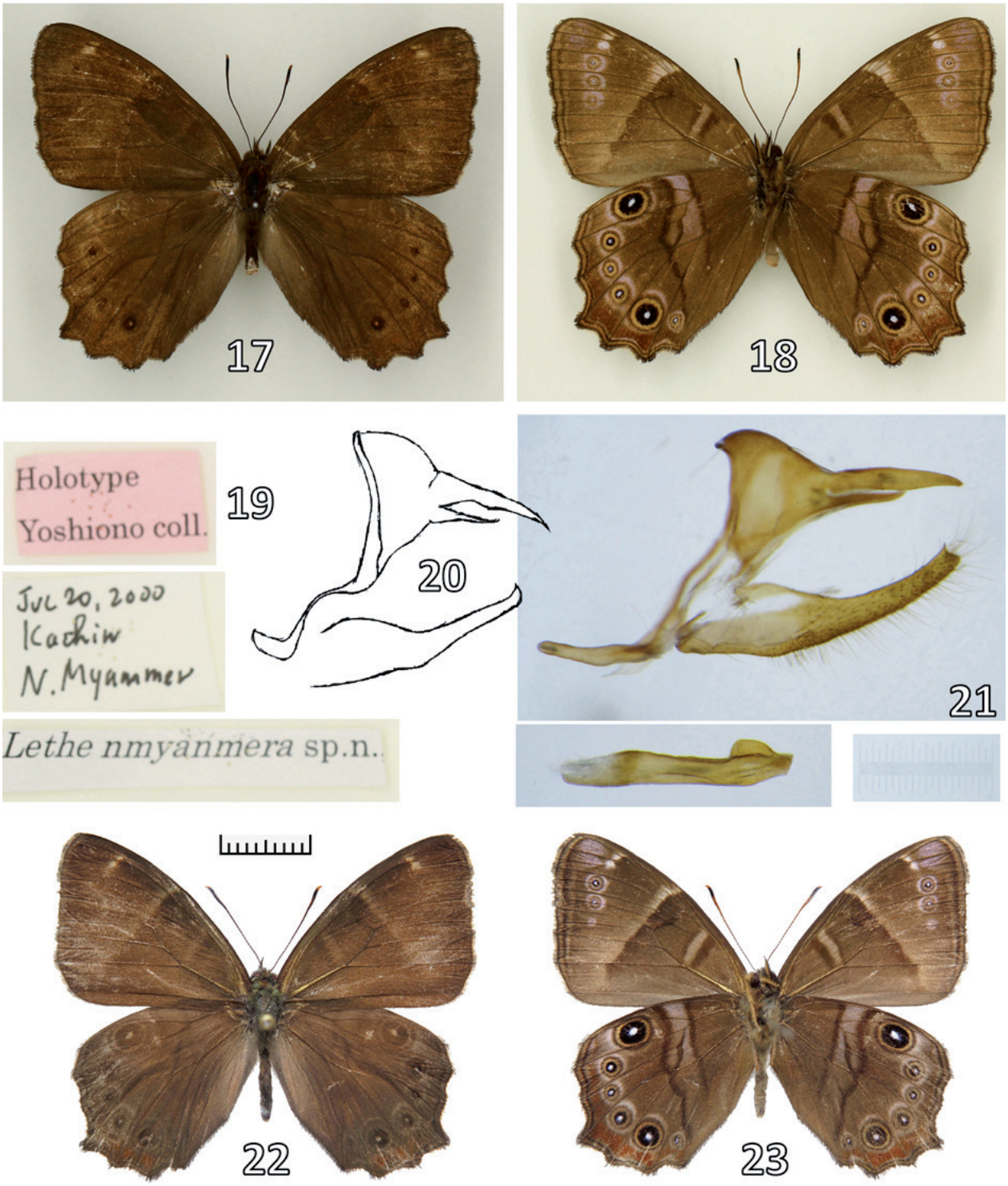

Fig. 17, 18, 19: *Lethe kazuichiroi* Yoshino, 2008, holotype ♂, N. Myanmar, Kachin, MNHAH, dorsal-, ventral side and labels, photographed by Mr. Norio Nakamura.

Fig. 20: ♂ genitalia of *Lethe kazuichiroi* Yoshino, 2008 in lateral view, "Page 14: *Lethe kazuichiroi* **sp. n**" in Yoshino (2008).

Fig. 21: ♂ genitalia of *Lethe kazuichiroi* Yoshino, 2008 in lateral view with left valva removed, China, Yunnan, Gongshan, LSY.

Fig. 22, 23: *Lethe kazuichiroi* Yoshino, 2008, ♂, China, Yunnan, Gongshan, LSY, dorsal- and ventral side.

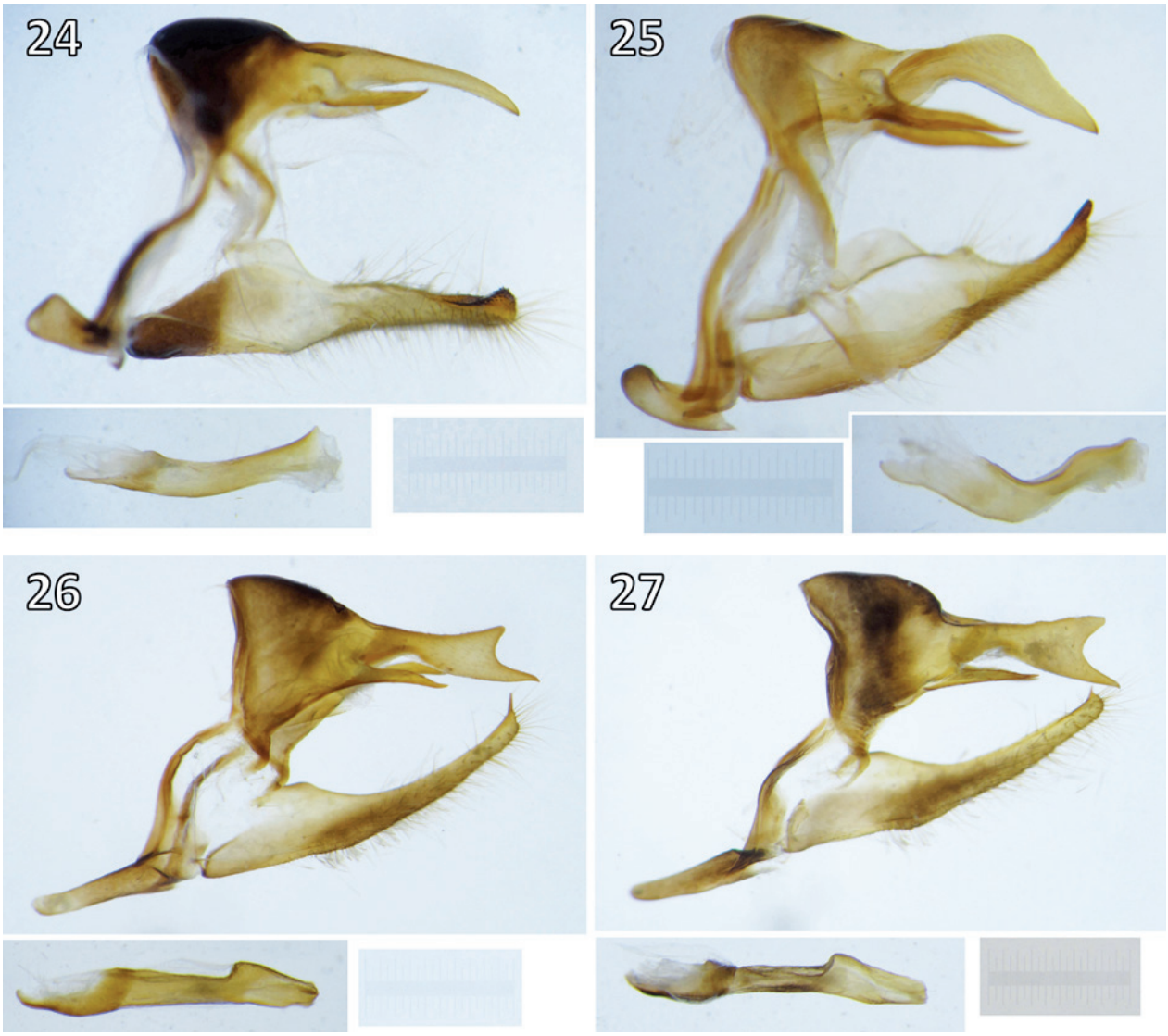

Fig. 24: ♂ genitalia of *Lethe nosei* (Koiwaya, 2000) **comb. nov.** in lateral view with left valva removed, China, Yunnan, Gongshan, LSY.
Fig. 25: ♂ genitalia of *Lethe wui* Huang, 1999 in lateral view with left valva removed, China, Yunnan, Gongshan, LSY.
Fig. 26: ♂ genitalia of *Lethe albolineata* (Poujade, 1884) in lateral view with left valva removed, China, Sichuan, Ebian, LSY.
Fig. 27: ♂ genitalia of *Lethe albolineata ruoyuae* **subspec. nov.** in lateral view with left valva removed, holotype, CHINA, Yunnan, Gongshan, LSY.

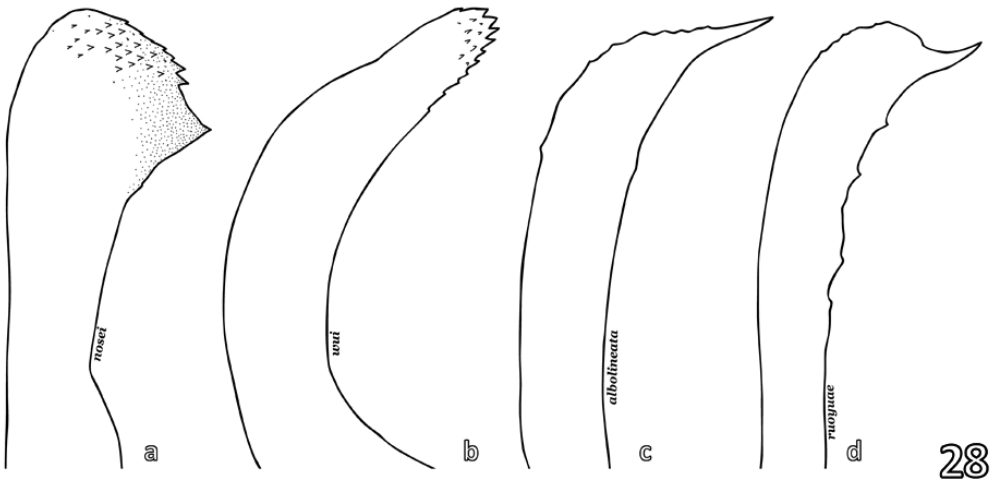

Fig. 28: Tip of the ♂ valva in dorsal view. (a) *Lethe nosei* (Koiwaya, 2000) **comb. nov.**, China, Yunnan, Gongshan, LSY; (b) *Lethe wui* Huang, 1999, China, Yunnan, Gongshan, LSY; (c) *Lethe albolineata* (Poujade, 1884), China, Sichuan, Ebian, LSY; (d) *Lethe albolineata ruoyuae* **subspec. nov.**, holotype, China, Yunnan, Gongshan, LSY.